

Bell Work: Pre AP
20-Aug-2015

Why is it important to be able to email a document to somebody, give two reasons that are not school focused?

What is the relationship between measuring units, commerce, and education?

Agenda

Metric System questions

Dimensional analysis recap

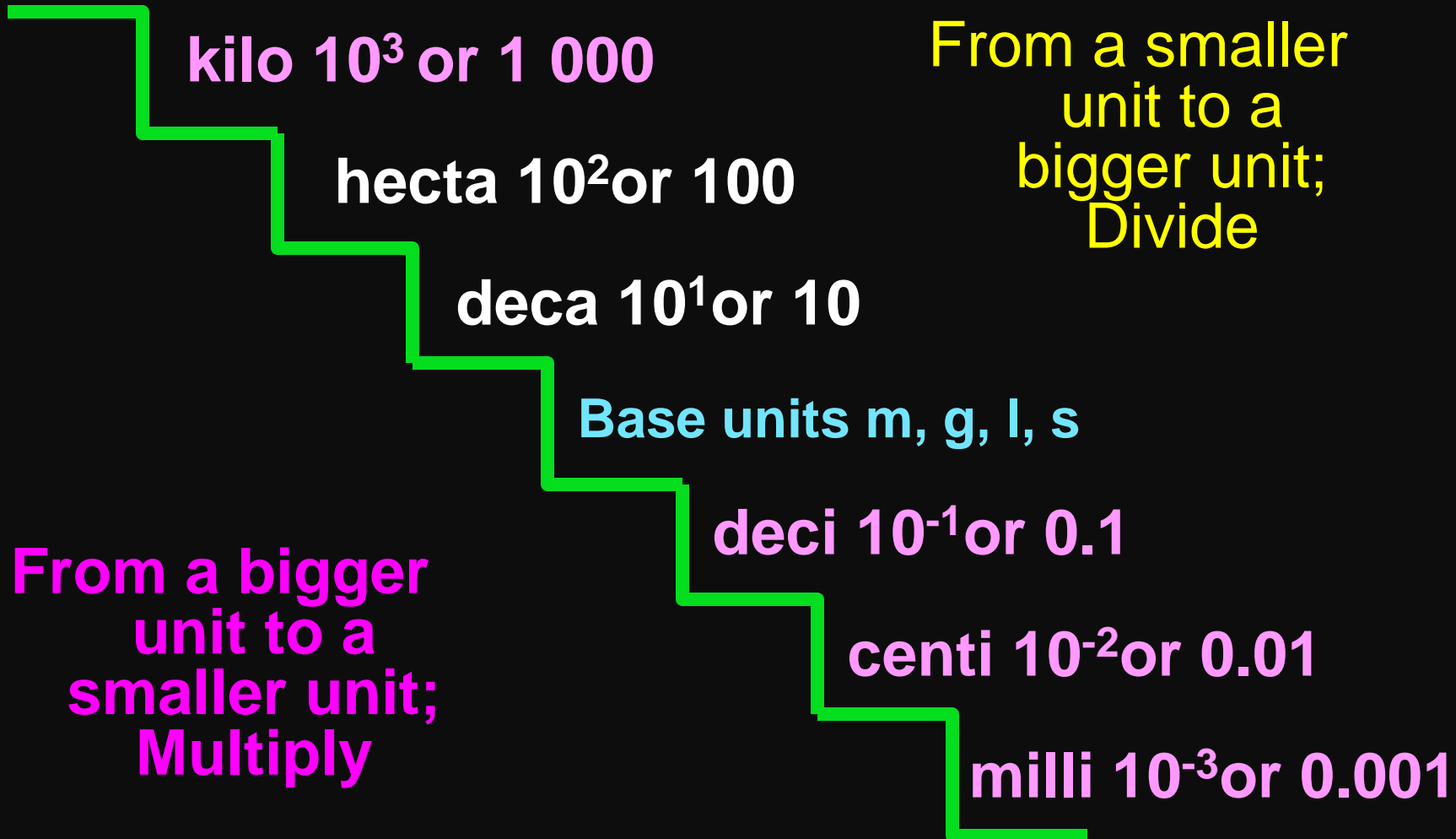
Objectives

Use dimensional analysis to convert units
in the metric system


THE METRIC SYSTEM

<u>Metric (SI)</u>	<u>Unit</u>	<u>Standard System</u>
Meter (m) (mm, cm, km)	<u>Length</u>	Yard (inch, foot, mile)
Gram (g) (mg, cg, kg)	<u>Mass</u>	Pound (ounce, ton)
Celsius (°C)	<u>Temperature</u>	Fahrenheit (°F)
Liter (L) (mL, cL, kL)	<u>Volume</u>	Quart (tspn, tbl, cup, pint, gallon)
Second (s)	<u>Time</u>	Second (s)
Speed (m/s)	<u>Derived Units</u> (Combination of Base Units)	Speed (ft/s)

The Metric System



The Metric System

Prefix	Symbol	Value	Factor
kilo-	k	1 000 (thousand)	10^3
hecto-	h	100 (hundred)	10^2
deca-	da	10 (ten)	10^1
	<u>m, L, s, g</u>	One (Base Unit)	10^0
deci-	d	0.1 (tenth)	10^{-1}
centi-	c	0.01 (hundredth)	10^{-2}
milli-	m	0.001 (thousandth)	10^{-3}

Converting in the Metric System: Dimensional Analysis

Moving the decimal place is helpful and fast,
but not as useful as using dimensional
analysis and conversion factors.

Ex. How many mm in 1m?

First – Determine what the conversion factors
are, how are the two units related.

$$1000mm:1m \qquad \frac{1000mm}{1m} \qquad \frac{1m}{1000mm}$$

Converting in the Metric System: Dimensional Analysis

Ex. How many mm in 1m?

Second- Which conversion factor will let you cancel out the unit you have and end with the unit you want, when multiplying?

We want mm and need to cancel out m:

$$1\text{m} \times \underline{\quad ? \quad}$$

$$1000\text{mm} : 1\text{m}$$

$$\frac{1000\text{mm}}{1\text{m}}$$

$$\frac{1\text{m}}{1000\text{mm}}$$

Converting in the Metric System: Dimensional Analysis

Ex. How many mm in 1m?

Third – Set up the conversion and carry it out.

$$\cancel{1m} \times \frac{1000mm}{\cancel{1m}} = 1\ 000mm$$

Converting in the Metric System: Dimensional Analysis

You try: How many ml are in 3dl?

First - What is the relation ship between ml and dl,
and the possible conversion factors?

Second – which conversion factor will get give us
our desired unit?

Third – Cary out the conversion

$$3\cancel{dl} \times \frac{100ml}{1\cancel{dl}} = 300ml$$

Practice

How many mm are there in 2.1km?

Need to go from km to mm

km → base(meter) → deci → centi → milli

$$2.1\text{km} \times \underline{1\,000\,000\text{mm}} =$$

~~km~~

2 100 000 mm

Converting Metric Units

Making more from a larger number

Multiply by base 10 (number of spaces)

Ex. Convert 2.3 kg to g

$$2.3 \text{ kg} \times \text{______} \text{g} =$$

Ex. Convert 5.7 g to mg.

$$5.7 \text{ g} \times \text{______} \text{mg} =$$

The Metric System

Converting Metric Units

Making less from a number

Divide by base 10 (number of spaces)

Ex. Convert 1.5 g to kg.

$$1.5 \text{ g} \times \text{_____kg} =$$

Ex. Convert 8.2 mg to _____ g.

$$8.2 \text{ mg} \times \text{_____g} =$$

Dimensional Analysis

Start with
the value
and unit
you have

Choose a conversion factor
that allows you to cancel
out the starting (given) unit

$$\text{given} \times \frac{\text{desired}}{\text{given}} =$$

Example: 4.5dm to km

$$4.5\text{dm} \times \frac{1\text{km}}{10000\text{dm}} =$$

Using Dimensional Analysis

If you have a 71in tall person,
how tall are they in cm?

**First: Find an equivalence
between in and cm, then write
the two conversion factors**

$$\frac{1\text{in}}{2.54\text{cm}}$$

or

$$\frac{2.54\text{cm}}{1\text{in}}$$

**Second: Pick the conversion factor that
lets you cancel out the given unit**

**Third: Carry out the
conversion**

$$71\text{in} \times \frac{2.54\text{cm}}{1\text{in}} =$$

LENGTH : Imperial to Metric		
1 inch(in)	2.54cm	25.4mm
6 inches	15.24cm	152.4mm
1 Foot	30.48cm	304.8mm
1 Yard	91.44cm	914.4mm
1 Foot	30.48cm	0.3048m
6 Feet	182.88cm	1.828m
12 Feet	365.76cm	3.657m
30 Feet	914.40cm	9.144m
50 Feet	1524.00cm	15.240m

The Kilo Gram

<http://youtu.be/ZMByl4s-D-Y>

The Metric System

Practice problems – Convert using dimensional analysis.

550 millimeters to meters

3.5 moles to millimoles

1.6 kilograms to gram

2500 milligrams to kilograms

4.0 centimeters to millimeters

5 liters to milliliters

Dimensional Analysis

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the value
and unit
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Choose a conversion factor
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$$\text{given} \times \frac{\text{desired}}{\text{given}} =$$

Example: 4.5dm to km

$$4.5dm \times \frac{1km}{10000dm} =$$

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Before you Leave

What are four (4) metric prefixes you need to commit to memory?

Write out the step for using dimensional analysis on a scratch piece of paper.

Bell Work

21-Aug-2015

1. What is the area of the circle in the picture below in m^2 ? ($A_{\text{circle}} = \pi r^2$, $1\text{ft} = 0.305\text{m}$)

2. If the area of the parking lot is $16\,288\text{m}^2$, what percent of the circle is the parking lot?



**Diameter is
1 055.8ft**

EQ: What is the relationship between measuring units, commerce, and education?

Agenda

Metric System questions

Dimensional analysis recap

Objectives

Use dimensional analysis to convert units
in the metric system

Turn in
21-Aug-2015

1. Bell Work #1
2. Basic Math Skills; staple work page to handout.

Safety Quiz

In order to be able to complete lab you need to earn a 100% on the safety quiz. It can be taken as often as you like until you pass 1x a day.

Groups of the Periodic Table

1. Turn in your instruction and rubric sheets.
2. Present your element individually and “group” as a team.
3. Hang on designated white board in lab.

The Kilo Gram

<http://youtu.be/ZMByl4s-D-Y>

Homework
21-Aug-2015

Dimensional analysis practice, #1-15

Bell Work
24-Aug-2015
New Bell Work # 2

If a car gas tank consumed 4.5mL of fuel every 15seconds, how long will it take a 45L tank to empty?

EQ: How can time management skills practices in class/ lab be useful in helping you get enough sleep at night?

Agenda

“Groups of periods Table presentations”

Time to a million

Dimensional Analysis practice

Root prefixes

Hypo-

“a prefix appearing in loanwords from Greek, where it meant “under”

Examples

Hypodermic, **hypo**ventilating,
hypothermia

Bell Work

25-Aug-2015

- A. What was the average rate, \$/s, for counting \$20?
- B. How many days will it take to count out \$1million one (1) dollar bills at the rate we calculated in lab?

EQ: How can time management skills practices in class/ lab be useful in helping you get enough sleep at night?

Agenda

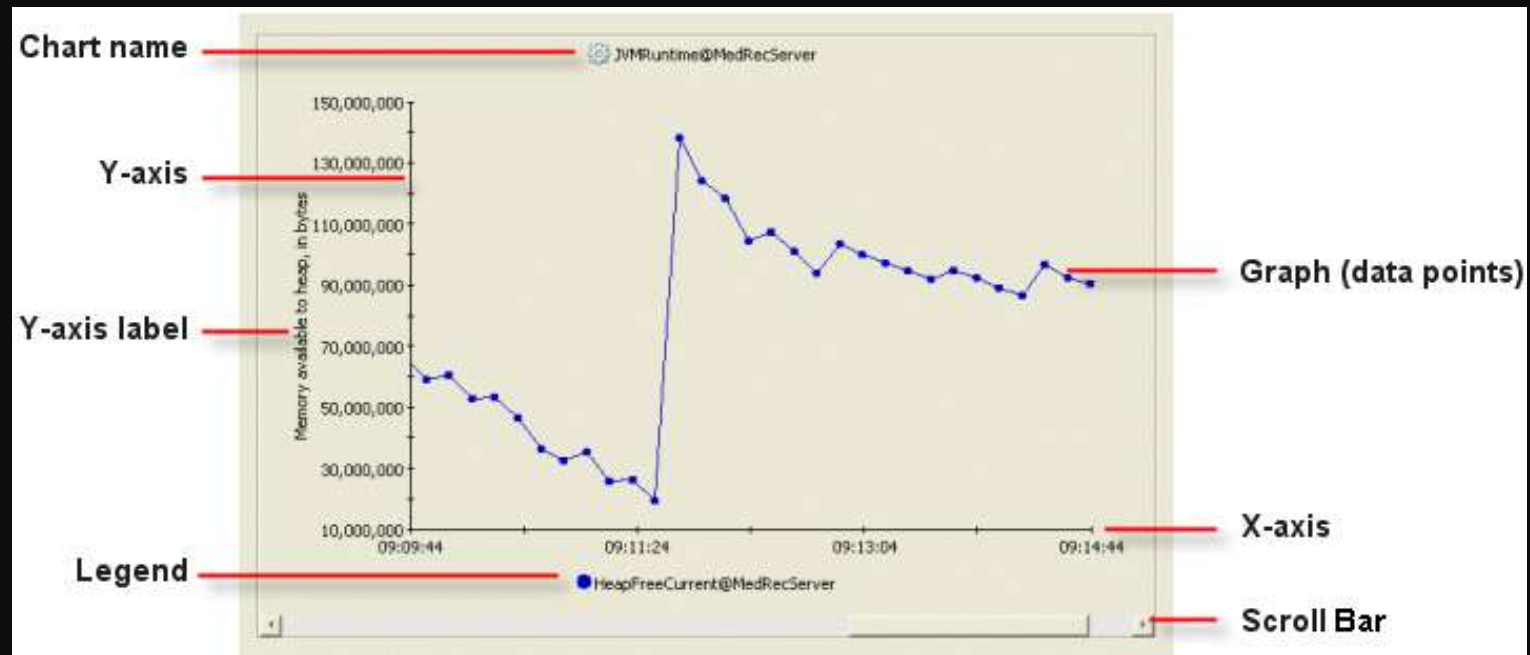
Graphing data

How to light a Bunsen Burner

Graphing

Make a data table (4 columns and 4 rows).

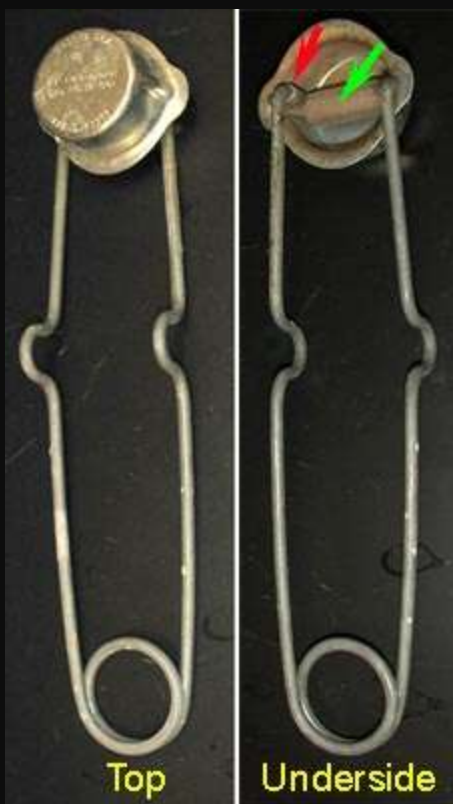
Graph your results



Bunsen Burner

You will use a striker to light the burner.

1. Turn gas on
2. place striker 1-3cm above burner
3. Strike striker to light
4. Adjust flame using gas valve and air intake



Homework

25-Aug-15

Make a line graph using data set from \$20 time count.

Graph labels (title, axis, etc.)

Axis numbers/ units

Key/ Ledger for lines/ Data

Bell Work

26.Aug.2015

A. Get a new, blank piece of paper and set it up as follows. Leave room for each item

B. Be prepared to turn in your Dimensional Analysis Practice and Time \$20 Graph

Basic laboratory Skills		Name
		Period
		Date
Purpose/ Objective:	_____→	
Safety:	_____→	
Pre lab Calculations:	_____→	
Procedures		Observation
↓		↓

EQ: How can time management skills practices in class/ lab be useful in helping you get enough sleep at night?

Agenda

Basic lab skills

Pre Lab Format

Use as many piece
of paper as you
need, use the back
side of the paper
for answering post
lab questions and
calculations only

Analysis and
conclusions should
be recorded at the
end of the pre lab
after the lab

Title		Name Period Date
Purpose/ Objective:		→
Safety:		→
Pre lab Calculations:		→
Procedures		Observation
↓		↓

Basic Lab Skills Lab

Complete as written,

All waste may go down drain.

Clean everything when you are finished

Home Work

26-Aug-2015

Start thinking of Science Fair projects, focus on concepts that interest you. Almost anything can be made a science project.

Home Work

26-Aug-2015

Start thinking of Science Fair projects, focus on concepts that interest you. Almost anything can be made a science project.

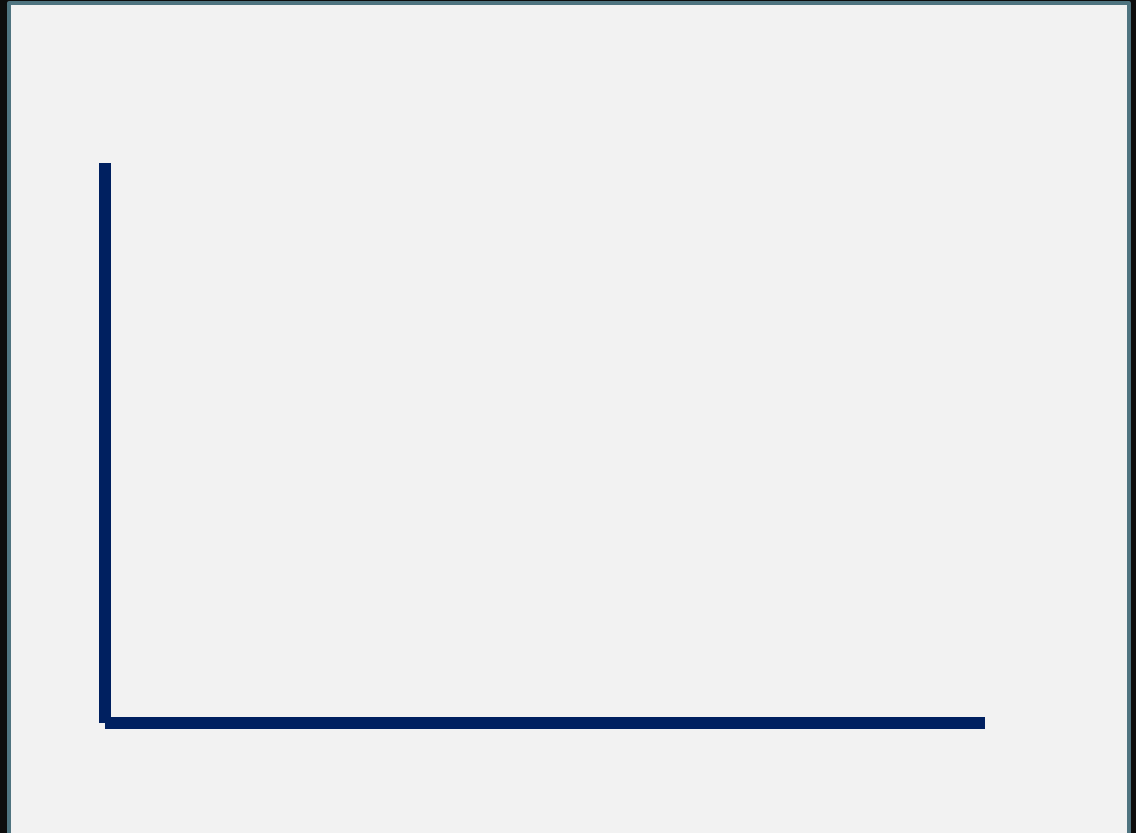
Bell Work

27-Aug-2015

Graph the following data points as a line graph.

A vs. Z and Blah

Protons	Mass	SDS
3	7	3
4	9	5
5	11	5.5
6	12	7
7	14	8
8	16	6.5
9	18	5
10	20	4



EQ: How can time management skills practices in class/ lab be useful in helping you get enough sleep at night?

Agenda

- Basic Lab Skills Analysis
- Sig figs
- Finish the “kilogram”
- You will be able to write numbers in scientific notation
- Intro density

Dimensional Analysis: Tricky One

If 1 zag is equivalent to 4.5 ziggs, 3.5 wags is equal to 2 slaps, 0.75 wags is 5.5 ziggs, then how many zags would 10 slaps be?

(Hint, make a list of equalities)

~28.5 zags

Dimensional Analysis and Metric System Practice Pre-AP

30) This one might be a challenge. If a skittle weighs 1.125mg and a bag full of skittles weighs 310kg what is the maximum number of pills that the bag can hold? Hint the bag weighs only 75mg

Turn In
27-Aug-2015

-Basic Lab Skills

The Metric System

- ◎ Scientific Notation – Scientists use scientific notation to express very large or small numbers. For instance, the span of the universe and the size of viruses are expressed in scientific notation

Sci. Notation

Rules for converting (10 345)

- Move the decimal to make a number between 1 and 10.
- Write ($\times 10$ number of spaces)
 - Move the decimal to the right, + exponent (1.0345×10^4)
 - Move the decimal to the left, - exponent

The Metric System

Scientific Notation – going the other way

- The exponent is the number of places you move the decimal
 - If the decimal is negative (-), move left
 - If the decimal is positive (+), move right

Convert into Scientific Notation

10 000

0.0034

23 000 000

0.000 000 045

4 500 000 000

0.000 000 000 000 056

1.456×10^4

7.0×10^3

9.11×10^6

3.3×10^{-9}

7.89×10^2

$0.000\ 005 \times 10^6$

The Kilo Gram

<http://youtu.be/ZMByl4s-D-Y>

Home Work
27-Aug-2015

Read 36-41

#11, 12, 13 on p39

Lab tomorrow, 28 Aug

Before you Leave

What are four (4) metric prefixes you need to commit to memory?

Write out the step for using dimensional analysis on a scratch piece of paper.